

SECTION 109 – PASSENGER ELEVATOR

1. GENERAL

This section shall include a detailed description of the oil hydraulic passenger elevator to be furnished and installed by the Contractor.

2. DESCRIPTION OF EQUIPMENT

CONTROL:	Oil Hydraulic
CAPACITY:	2000 lbs. min.
SPEED:	115-fpm min.
OPERATION:	Selective-Collective
CAR SIZE:	6' –8' W X 4' –3' D (Clear Inside)
TRAVEL:	30' Approx.
POWER SUPPLY:	400 Volts, 3 Phase, 60 Cycle
MACHINE LOCATION:	Adjacent @ basement level
STOPS:	3
OPENINGS:	3 in line
HOISTWAY DOORS:	3'-0" W X 7'-0" H (Single Slide)
PIT DEPTH	7'-6"
OVERHEAD	12'
DOOR OPERATION:	Automatic
HOISTWAY:	7'-9" W X 7'-4" D
SIGNALS:	Car & Hail Registration Lights Car Position Indicator Hall Lanterns
SPECIAL FEATURES:	Photo-electric passenger sensing devices Emergency lighting and alarm bell Handicapped features per ANSIA 117.1 requirements
WALLS:	Formica
CANOPY:	Steel

FRONT & TRANSOM:	Stainless Steel
DOORS:	Stainless Steel
CEILING:	Suspended diffuser
LIGHTING:	Fluorescent
EMERGENCY LIGHTING:	Per Code
SILL:	Aluminum
HANDRAIL(S):	Continuous stainless steel on rear
ACCESSORIES:	Exhaust/Ventilation Fan

3. PLATFORM AND SLING

The platform shall have a fabricated frame of formed or structural steel shapes, gusseted and rigidly welded. Flooring shall be wood top floor laid over wood subfloor. The underside of the platform will be fireproofed.

The sling shall consist of heavy steel stiles properly affixed to a steel crosshead and bolster, with adequate bracing members, to remove all strain from the car enclosure.

Steel bumper plates shall be affixed to bottom of bolster channels, and a platen plate with clamps and cap screws shall be furnished for fastening sling to plunger.

4. GUIDES AND GUIDE SHOES

Guides for the elevator car shall be planed steel elevator guide rails, properly fastened to the building structure with steel brackets. The car stile shall be fitted at top and bottom with guide shoes of the self-aligning, swivel type, with metal body and removable non-metallic liners.

5. POWER UNIT

Oil Pumping and Control Mechanism shall be designed with all of the components listed below combined in a self-contained unit; oil reservoir with tank cover and controller compartment with cover; a submerged oil-hydraulic pump; an electric motor; an oil control unit with the following components: a high pressure relief valve; a check valve; an automatic unloading up start valve; a lowering and leveling valve; and a magnetic controller.

The pump shall be especially designed and manufactured for oil-hydraulic elevator service. It shall be of the positive displacement type, inherently designed for steady discharge with minimum pulsations to give smooth and quiet operation. Output of pump shall not vary more than 10% between no load and full load on the elevator car.

Drive shall be by direct coupling.

Motor shall be especially designed for oil-hydraulic elevator service, of standard manufacture, and of duty rating to comply with herein specified speeds and loads.

Oil Control Unit shall consist of the following components:

Relief Valve shall be externally adjustable, and shall be capable of bypassing the total oil flow without increasing back pressure more than 50% above working pressure.

Up Start and Stop Valve shall be externally adjustable, and designed to bypass oil flow during start and stop of motor pump assembly. Valve shall close slowly, gradually diverting oil to or from the Jack Unit, insuring smooth up starts and up stops.

Check Valve shall be designed to close quietly without permitting any perceptible reverse flow.

Lowering Valve and Leveling Valve shall be externally adjustable for drop-away speed, lowering speed, leveling speed and stopping speed to insure smooth "Down" starts and stops. The leveling valve shall be designed to level the car to the floor in the direction the car is traveling when slowdown is initiated.

Electric controller shall be of the full magnetic type and solid state integrated circuitry. Silver to silver contacts shall be utilized on all relays and contactors. Thermal overload relays to be provided to protect the motor. All component switches to be mounted in a NEMA I enclosure.

6. JACK UNIT

The jack unit shall be of sufficient size to list the gross load the height specified and shall be factory tested to insure adequate strength and freedom from leakage. No brittle material, such as grey cast iron, shall be used in the jack construction.

The jack unit shall consist of the following parts: a plunger of heavy seamless steel tubing accurately turned and polished; a stop ring shall be electrically welded to the plunger to positively prevent plunger leaving the cylinder; an internal guide bearing; packing or seal of suitable design and quality; a drip ring around cylinder top; a cylinder made of steel pipe and provided with a pipe connection and air bleeder. Brackets shall be welded to the jack cylinder for supporting the elevator on pit channels. An auxiliary safety bulkhead shall be provided in the lower end of the cylinder.

7. HOLE FOR JACK UNIT

The Contractor shall be responsible for drilling the jack hole and shall provide, when necessary, an auxiliary casing. No allowance or extra shall be made for rock, water or unusual soil conditions except should water mains, telephone and electrical mains or sewers be encountered in the drilling.

8. JACK CYLINDER PROTECTION

The jack cylinder and any underground piping shall be double wrapped with an approved coating designed to help protect if from electrolytic and chemical corrosion.

9. WIRING, PIPING AND OIL

All necessary wiring shall be furnished and installed in the hoistway in accord with the National Electrical Code. All necessary pipe and fittings to connect the power unit to the jack unit and oil of the proper grade shall be furnished.

10. AUTOMATIC GUIDE RAIL LUBRICATORS

Lubricators shall be provided and mounted on top of upper guide shoes. Wool felt wiper shall apply an even, uniform flow of oil which shall thoroughly lubricate faces of guide rail from leakproof oil reservoir.

11. FAILURE PROTECTION

The electrical control circuit shall be designed so that if a malfunction should occur, due to motor starter failure, oil becoming low in the system, or the car failing to reach a landing in the up direction within a pre-determined time, the elevator car will automatically descend to the lowest terminal landing. If power operated doors are used, the doors will automatically open when the car reaches that landing to allow passengers to depart. The doors will then automatically close and all control buttons, except the "door open" button in the car station, shall be made inoperative.

12. SOUND INSULATING PANELS

These panels shall be manufactured of reinforced 16 gauge steel with a 1" thick 1½ # core of fiberglass affixed to interior shall be mounted on all four open sides of the power unit frame.

13. SOUNG ISOLATING COUPLINGS

There shall be a minimum of two sound insulating couplings, installed in the oil line in the machine room between pump and jack.

14. OIL-HYDRAULIC SILENCER

A silencer/muffler device shall be installed at the power unit location. It shall contain pulsation absorbing material inserted in a blowout proof housing arranged for inspecting interior parts without removing unit from oil line. Rubber hose without blowout proof features will not be acceptable.

15. VIBRATION PADS

These vibration pads shall be mounted under the power unit assembly to isolate the unit from the building structure.

16. EMERGENCY TERMINAL STOPPING DEVICE

An emergency terminal stopping device for speeds over 100 FPM shall be provided which shall operate independently of the normal terminal stopping device should it fail to slow down the car at the terminal as intended. They shall be so designed and installed that a single short circuit caused by a combination of grounds, or by other conditions, shall not prevent their functioning.

The normal and emergency terminal stopping devices shall not control the same controller switches unless two or more separate and independent switches are furnished, two of which shall be closed in either direction of travel to complete the circuit to the control valve solenoids in the down direction and to complete the circuit to the pump motor for the up direction of travel.

17. AUTOMATIC TERMINAL LIMITS

Electric limit switches shall be placed in the hatchway near the terminal landings and be designed to cut off the electric current and stop the car should it run beyond either terminal landing.

18. AUTOMATIC SELF-LEVELING

The elevator shall be provided with self-leveling feature that will automatically bring the car to the floor landings. This self-leveling shall, within its zone, be entirely automatic and independent of the operating device and shall correct for overtravel or undertravel. The car shall also be maintained approximately level with the landing irrespective of the load.

19. BUFFERS

Substantial buffers shall be furnished and installed in the elevator pit. They shall be mounted on continuous channels fastened to the elevator guide rail or securely anchored to the pit floor and substantial extensions will be provided, if required.

20. CAR TOP INSPECTION STATION

A car top inspection station with an “emergency stop” switch and with constant pressure “up-down” direction buttons shall make the normal operating devices inoperative and give the inspector complete control of the elevator.

21. DOOR OPERATION

A direct current motor driven heavy duty operator shall be furnished and installed, designed to operate the car and hoistway doors simultaneously. Door movements shall be electrically cushioned at both limits of travel and the door operating mechanism shall be arranged for manual operation in the event of power failure. The leading edge of the car door shall be provided with a retractable reversal edge arranged to automatically return car and hoistway doors to the open position in event the doors are obstructed during closing cycle. Doors will then resume closing cycle. Doors shall automatically open when the car arrives at the landing and shall automatically close after an adjustable time interval or when the car is dispatched to another landing. Direct drive geared operators, A.C. controlled units with oil checks, or other deviations from the above are not acceptable.

22. INTERLOCKS

Each hoistway entrance shall be equipped with an approved type interlock tested as required by Code. The interlock shall be designed to prevent operation of the car away from the landing until the doors are locked in the closed position as defined by Code and shall prevent opening the doors at any landing from the corridor side unless the car is at rest at the landing or is in the leveling zone and stopping at that landing. Interlocks shall bear Underwriters’ Laboratories “B” label of approval.

23. HOISTWAY DOOR UNLOCKING DEVICE

Hoistway door unlocking devices as specified by the ANSI A-17.1 Code shall be provided to permit authorized persons to gain access to hoistway when elevator car is away from the landing.

24. DOOR HANGERS AND TRACKS

For each hoistway sliding door, furnish and install sheave type two point suspension hangers and tracks complete. Sheaves shall have polyurethane tires with ball bearings properly sealed to retain grease. Hangers shall be provided with an adjustable slide to take the up-thrust of the doors. Tracks are to be drawn steel shapes, smooth surface and shaped to conform to the hanger sheaves.

25. HOISTWAY ENTRANCES

Hoistway entrances of the hollow metal, horizontal sliding type shall be furnished and installed complete at each of the hoistway openings.

Entrances will be manufacturer's standard design and shall bear Underwriters' Laboratories "B" labels. They shall consist of framers, extruded aluminum, sills, doors, hangers, hanger supports, hanger covers, fascia plates, sight guards, and all necessary hardware. Finish to be solid color enamel as selected from elevator manufacturer's standard colors.

The entire front wall of the hoistway is to be left open or a rough opening provided which is 12" greater in width and 6" greater in height than the finished opening, until after entrances are installed. After guide rails are set and lined, the entrance frames shall be installed in perfect alignment with the guide rails. Finished walls will then be completed by others.

26. CAR DOORS

The car entrance shall be provided with horizontal sliding doors. Panel rigidity to be obtained by suitable steel reinforcements. Doors shall be hung on sheave type hangers with polyurethane tires that roll on a polished steel track, and guided at the bottom by non-metallic shoes sliding in a smooth threshold groove.

27. SELECTIVE COLLECTIVE AUTOMATIC PUSH BUTTON OPERATION

Control of the elevator shall be automatic in operation by means of push buttons in the car numbered to correspond to floors served, for registering car stops by "up-down" push buttons at each intermediate landing and "call" push buttons at terminal landings. The momentary pressing of one or more buttons shall dispatch the car to the designated landings in the order in which the landings are reached by the car, irrespective of the sequence in which the buttons are pressed. Each landing call shall be cancelled when answered. When the car is traveling in the up direction, it shall stop at all floors for which car buttons or "up" hall buttons have been pressed; it shall not stop at floors when "down" buttons only have been pressed, unless the stop for that floor has been registered by the car button, or unless the down call is at the highest floor for which any buttons have been pressed. Likewise, the pressing of an "up" button when the car is traveling in the down direction shall not intercept the travel unless the stop for that floor has been registered by a car button, or unless the up call is the lowest for which any button has been pressed.

When the car has responded to its highest or lowest stop, and stops are registered for the opposite direction, its direction of travel shall reverse automatically and it shall then answer the calls registered for that direction.

Should both up and down calls be registered at an intermediate floor, only the call corresponding to the direction in which the car is traveling shall be cancelled upon the stopping of the car at the landing.

An adjustable time delay shall be provided so that after the car has stopped in response to a hall button, the entering passenger may register his car button before the car will reverse to answer calls in the opposite direction.

A key switch, located at the intermediate level (ground floor), shall deactivate all "call" push buttons at all three (3) levels.

Passenger access to the lower (basement) will be permitted only by a key operation in the car. However, the car can be called to the lower level (basement) by using the lower level (basement) "call" push button.

28. ELECTRONIC PASSENGER SENSING DEVICE

A solid state electronic detector designed to operate as described below shall be provided at the entrance of the elevator car. In addition, an electro-mechanical reversal edge shall be provided on the leading edge of the car door.

After a stop is made, the doors shall remain open for an adjustable time interval. Closing may be initiated instantaneously by registration of a car call.

The doors will remain open as long as the electronic detector senses the presence of a passenger or object in the door opening. If door movement is obstructed for a predetermined time, the doors will resume normal closing operation. If the electro-mechanical reversal edge contacts a person or object while closing, the doors will immediately stop and reopen. Closing will be initiated on-half second after the passenger or object has moved from the opening.

29. HANDICAPPED FEATURES PER ANSI A 117.1 REQUIREMENTS

Car station with raised numerals and letters Special car indicator with audible signals Car riding lantern with one audible signal for UP and two audible signals for DOWN Door jamb marking

30. ALARM BELL

An emergency alarm bell shall be connected to a plainly marked push button on the car.

31. WORK BY OTHERS

Preparatory work in conjunction with the elevator installation shall be done by Others and shall consist of the following.

A. Providing a legal hoistway, properly framed and enclosed, which shall withstand the forces and loads resulting from the use of the elevator. Furnish a pit of proper depth with pit ladder, drains and waterproofing as required. Preparing a properly lighted, heated and ventilated, fire-resistant machine room, including concrete floors and foundations with adequate access doors, guards, etc. as required.

B. Furnish in place, as required and located on the drawings, all supports for the guide rail brackets. Contractor shall provide inserts for setting by Others as required. Guarding and protecting the hoistway during the time the equipment is being installed. Do all cutting and patching of beams, wall and masonry work required, including repairs to plaster. Provide all chases and openings as required by the Contractor as shown on the elevator drawings.

C. Provide proper electric feeder wires to the terminals of the elevator control panel and include necessary mainline switches, circuit breakers or fuses. Provide all necessary outlets in the hoistway for the car lights, in the machine room for elevator signal equipment and in the pit for the pit light. Power of necessary characteristics during the erection of the elevator to provide illumination, operation of the required tools, hoists and power for starting, testing and adjusting the elevators.

D. Remove all excess dirt and debris accumulating from excavation of the cylinder hole.

E. Furnish still supports, including steel angles where required and still recesses and the grouting of the door sills after installation.

F. Heat and smoke sensing devices at elevator lobbies on each floor with electrical conductors terminating at a properly marked panel in the elevator machine room.

G. Wiring from elevator hoistway to outside alarm bell as required by the American National Safety Code for Elevators (bell by Contractor).

H. Any governmentally required safety provisions not directly involved in the elevator installation.

I. All painting, except as otherwise specified.

J. Access thru building to hoistway for material.